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DOUGLAS-FIR BEETLE INFESTATION NORTHERN ROCKY MOUNTAIN REGION 1952

Forest Insect Laboratory
Coeur d'Alene, Idaho
November 1952

18,800,000
15,077,449
33,877,449

DOUGLAS-FIR BEETLE INFESTATION
NORTHERN ROCKY MOUNTAIN REGION
1952

During past years many public and private foresters have considered the Douglas-fir beetle as the most destructive forest insect of the Northern Rocky Mountain Region (Forest Service - Region One). This bark beetle attacks and kills mature Douglas-fir trees. During the past thirty years the loss of Douglas-fir as a result of these attacks has been placed at 1,779,000 thousand board feet. This estimate is conservatively low and does not depict the full importance of this insect as an enemy of Douglas-fir.

Within the forests of Region One there are 2,036,498 acres of Douglas-fir type (50+% Douglas-fir), which are of all ownerships. On this acreage there are ~~11,734,504~~ 18,800,000 thousand board feet (Dec. C.) of Douglas-fir saw timber. In addition to the above volume of Douglas-fir, there are ~~13,085,948~~ 15,077,449 thousand board feet of Douglas-fir saw timber that are in a much ~~larger~~ acreage of other forest types. Within the region there is a total volume of ~~24,820,452~~ 33,877,449 thousand board feet of Douglas-fir.

Douglas-fir beetles are found in all stands of mature Douglas-fir. Their presence is revealed by the discolored foliage of trees attacked and killed the previous season. New or current season's attacks are identified by fine boring dust that is caught in bark crevices, or around the base of the tree. This dust is made by the adult beetles as they bore through the bark in making their attack. Attacked trees occur as scattered individuals and as small to large groups. The annual loss may be but a small fraction of a tree per acre, or it may be several trees. Normally this loss is held to a low level by natural control factors, but epidemic outbreaks often develop, and large volumes of timber are destroyed in a few years. Although the Douglas-fir bark beetle attacks and kills apparently healthy trees, windfalls, and trees of low vigor are preferred hosts. It is while breeding in this class of attractive host material that destructive epidemic beetle populations develop.

Many instances could be cited of severe economic losses of Douglas-fir that have occurred from epidemic outbreaks. The most recent outbreak developed within the forests of the Clearwater River drainage of northern Idaho in 1951. Throughout this drainage there were large areas of red-topped trees (1949 and 1950 attacks) occurring as scattered small groups and large almost complete kills. Surveys were made of portions of this drainage which showed the 1950 and 1951 attacks to be comparable in their severity. The loss of Douglas-fir for the two seasons was shown to be approximately 22 per cent of the total Douglas-fir stand. Although the infestation in this

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area was the heaviest recorded within the region, there were many other areas where severe losses were occurring. In view of the severe losses recorded in 1951, an extensive region-wide survey was planned for the 1952 season. This survey was designed to provide information that would depict the seriousness of the Douglas-fir beetle on a forest unit basis. In connection with this program of Douglas-fir beetle surveys, valuable assistance was given to this laboratory by the Potlatch Forests, Inc., and the State of Idaho. Each of these organizations provided a crew of three men to conduct reconnaissance surveys* within the private and State-owned lands of the Clearwater River drainage. This work was carried on during September and October. It was hoped that a detailed statement of this cooperation of both manpower and money could have been made a part of this report, but unfortunately the data requested was not received in time. However, the assistance was most essential to the completion of the planned survey program and was greatly appreciated.

1952 PROGRAM

During July 1952 an extensive aerial survey was made of all forested areas of the region. Along with other insect damage data, all areas of red-topped Douglas-fir trees were mapped and notations made as to their severity. Following this survey, ground reconnaissance surveys were made of areas with different recorded severity, to provide an estimate of loss for each forest as a unit. These reconnaissance surveys started on July 5, and continued through October.

Survey power available for this program of reconnaissance surveys made it necessary to direct the work to areas where previous detection surveys indicated past losses of Douglas-fir in varying degrees of severity. Unfortunately, at the time of the aerial detection survey, the 1951-attacked trees had not faded sufficiently to be discernible from the air. As a result, the groups of red tops that were observed, and to which the surveys were directed, were 1950 attacked trees. Obviously during the 1951 and 1952 attack seasons the areas of red tops observed could have undergone material changes. Observed losses could have increased materially, or the

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* Reconnaissance surveys are designed to provide information on the extent and general location of insect infestations, the extent and severity of the damage, and the need for further action. These surveys are in less detail, and of a lighter coverage than the more intensive appraisal surveys that are intended to provide information for control action programs.

infestations could have died down. Furthermore, in areas of green timber, where no red tops were recorded, there could be new infestations starting with current season's attacks.

Data obtained by this program of reconnaissance surveys provided an infested tree per acre figure, and a per cent of stems killed for 1952 and the two preceding seasons. These data were considered as a significant sample of the forest as a unit, but for determining the status of the infestation for any specific area, they were quite inadequate. It was intended to apply these loss figures to forest survey data to provide a total loss figure in trees and volume for the forest in question. However, an acreage figure for Douglas-fir is only available for Douglas-fir types or stands of more than 50 per cent of Douglas-fir. As this figure varies so for the different forests, it could not be used. As a result of this unforeseen difficulty, the survey data has been applied to a computed acreage of the general areas of Douglas-fir infestations as recorded by the aerial survey and other detection methods. Although this method will not give the total infestation for each forest, it will show the status of the severe infestations, which will not be far from a figure for the forest.

The following tabulation shows the data obtained on the different forests and areas covered by this season's Douglas-fir survey program. Detection surveys of other forests did not reveal infestations of sufficient severity to warrant more intensive surveys. There are infestations of the Douglas-fir beetle in all forests of the region which may at any time become serious. An example of such an outbreak occurred in the Beartooth Division of the Custer National Forest, where during the past few years practically all Douglas-fir has been killed on a large acreage. Surveys of this area in 1952 showed no new infestation.

STATUS OF DOUGLAS-FIR BEETLE INFESTATION
1952

Bitterroot National Forest

Acres of Sample	Douglas-Fir Stand on Sample		Attacked Trees Per Sample Acre			Per Cent of Trees Killed		
	Total Trees	Per A.	1950	1951	1952	1950	1951	1952
557.0	16,620	28.80	.21	.13	.06	.73	.45	.21
Total for three-year period				.40			1.39	

Computed acreage of infested areas 226,000
Total trees killed 1952 season 13,560

During the past three years there has been a steady decrease in the severity of the Douglas-fir beetle infestation on this forest. Infestations of this character are considered as normal, although from such situations the loss of timber soon builds to rather startling proportions. Of the 1,344,826 M.B.F. of Douglas-fir on the Bitterroot 861,502 M.B.F. is found on 170,428 acres of Douglas-fir type.

Clearwater National Forest

Acres of Sample	Douglas-Fir Stand on Sample		Attacked Trees Per Sample Acre			Per Cent of Trees Killed		
	Total Trees	Per A.	1950	1951	1952	1950	1951	1952
333.5	3,835	11.50	.21	.22	.44	1.83	1.91	3.83
Total for three-year period				.87			7.57	

Computed acreage of infested areas 77,000
Total trees killed 1952 season 33,000

The infestation within this forest is of a serious nature. During the past three years there has been a marked increase in the volume of Douglas-fir killed. Although there is no visual evidence of a decrease in 1953, such predictions are of little value. There are 27,048 acres of Douglas-fir type on this forest that contain only 150,757 M.B.F. The remainder of the total Douglas-fir volume, or 509,783 M.B.F. is found in other forest types of a large acreage where there is less than 50% Douglas-fir.

Coeur d'Alene National Forest

Acres of Sample	Douglas-Fir Stand on Sample Total Trees	Per A.	Attacked Trees Per Sample Acre 1950	1951	1952	Per Cent of Trees Killed 1950	1951	1952
195.5	2,579	13.19	.22	.22	.82	1.70	1.67	6.24
Total for three-year period				1.26			9.61	

Computed acreage of infested area	203,000
Total trees killed 1952 season	167,000

During the past season the Douglas-fir beetle infestation within the Coeur-d'Alene National Forest increased several fold in its severity. The existing situation is a serious one and large volumes of timber are being destroyed. Of the total volume of Douglas-fir that is on this forest 793,301 M.B.F. are found on 106,852 acres of Douglas-fir type, and the remainder 170,062 M.B.F. in other forest types.

Kaniksu National Forest

Acres of Sample	Douglas-Fir Stand on Sample Total Trees	Per A.	Attacked Trees Per Sample Acre 1950	1951	1952	Per Cent of Trees Killed 1950	1951	1952
175.5	2,098	28.80	.21	.20	.53	1.76	1.67	4.43
Total for three-year period				.69			5.95	

Computed acreage of infested areas	88,600
Total trees killed 1952 season	46,958

Data obtained from a survey of this forest indicates a marked increase in the severity of the Douglas-fir infestation. On some areas of the forest the increase was quite outstanding while in others it remained somewhat static. However, the 1952 situation is potentially serious, for although the loss of ½ of a tree per acre is not so severe for a year or two, such losses soon build to alarming proportions. All infested areas should be watched carefully. There is a total of 755,757 M.B.F. of Douglas-fir on the Kaniksu National Forest, with 525,345 M.B.F. on 83,814 acres of forest type.

Kootenai National Forest

Acres of Sample	Douglas-Fir Stand on Sample Total Trees	Per A.	Attacked Trees Per Sample Acre 1950	1951	1952	Per Cent of Trees Killed 1950	1951	1952
446.0	9,891	22.2	.31	.27	.97	1.32	1.14	3.94
Total for three-year period				1.55			6.40	

Computed acreage of infested areas 160,400
Total trees killed season 1952 155,500

Data obtained from the survey of this forest show a marked increase in the severity of the Douglas-fir beetle infestation, and the existence of a serious beetle situation. A loss of nearly a tree per acre with an average residual stocking of 22 trees per acre soon deletes the timber stand and amounts to a large volume. Serious losses of Douglas-fir have occurred on and near this forest during the past 10 years. There are 790,168 M.B.F. of Douglas-fir on this forest.

Lolo National Forest

Acres of Sample	Douglas-Fir Stand on Sample Total Trees	Per A.	Attacked Trees Per Sample Acre 1950	1951	1952	Per Cent of Trees Killed 1950	1951	1952
259.2	6,713	25.9	.16	.19	.28	.62	.72	1.08
Total for three-year period				.63			2.43	

Computed acreage of infested areas 89,200
Total trees killed season 1952 24,976

Data indicate a slight increase in the severity of the Douglas-fir beetle infestation during the past season. Although for the forest the situation is not overly severe at this time, but there are some areas where the loss is heavier than the average figures depict. Of the 1,052,244 M.B.F. of Douglas-fir on this forest only 403,477 M.B.F. are found in Douglas-fir types.

Nezperce National Forest

Acres of Sample	Douglas-Fir Stand on Sample Total Trees	Per A.	Attacked Trees Per Sample Acre 1950	1951	1952	Per Cent of Trees Killed 1950	1951	1952
150.2	1,739	11.58	.26	.16	.27	2.24	1.38	2.33
Total for three-year period				.69			5.95	

Computed acreage of infested areas 82,000
Total trees killed season 1952 22,140

There has been but little change in the status of the Douglas-fir beetle infestation on this forest during the past three years. However, there are some areas of rather severe infestations and past losses have been quite severe in other areas. Of the 2,703,336 M.B.F. of Douglas-fir that is on this forest 1,122,818 M.B.F. or less than half is found on 197,265 acres of Douglas-fir type.

St. Joe National Forest

Acres of Sample	Douglas-Fir Stand on Sample Total Trees	Per A.	Attacked Trees Per Sample Acre 1950	1951	1952	Per Cent of Trees Killed 1950	1951	1952
78.2	1,530	19.57	.20	.14	.11	1.05	.72	.59
Total for thee-year period				.45			2.36	

Acreage to which data are applied 47,000
Total trees killed season 1952 5,170

The rather limited survey data obtained are applied to an acreage along the upper St. Joe River drainage where they were obtained. There are other areas of the forest where the infestations of the Douglas-fir beetle are obviously more severe. This is especially true of the Palouse District, and of the forest areas within the Clearwater River drainage. The Clearwater River area was surveyed by crews from Potlatch Forests, Inc., and the State of Idaho. The severity of the infestation as recorded by these crews is shown in the presentation of their data in the following tabulation. It is estimated that there are 151,000 acres of Douglas-fir forests on the St. Joe National Forest.

Clearwater River Drainage

Clearwater Unit

	Area	Acres of Unit	Per Cent of Douglas-Fir Stand Killed by Beetles 1951	1952
1	N. F. Orofino Cr.	91,853	5	5
2A	Poorman Creek	22,246	2	2
3	Silver Creek	28,928	7	4
4	Bertha Hill	7,014	1	½
5	Benton Creek	28,544	6	5
6	N. F. Reed Cr.	589	2	2
7	Shanghi Pt.	2,432	24	16
8A	Rhodes Cr.	7,296	5	3
9	Dennison Cr.	896	24	5
		189,798	Ave. 4.8	Ave. 4.5

Potlatch Units

1	Island Ranch	49,408	4.1	5.2
1A	Dent (Potlatch Dick)	29,184	0	6.6
2	Lone Creek	11,110	0	11.7
3	Jackson Mountain	6,195	1.9	.5
4	Potlatch Creek	7,142	1.4	0
4A	Potlatch Creek	--	0	0
4B	Potlatch Creek	358	5.0	5.2
5	Floodwood	133,760	9.2	6.8
6	Upper Stony	845	1.7	2.3
6A	Outside Upper Stony	?	0	0
6B		?	0	.9
6C		?	0	1.0
7	St. Maries	1,152	1.7	2.3
8	Hidden Cr.	2,202	0	2.2
12+				
12A	Crain Pt.	9,958	3.6	3.8
13	Gold Hill	2,918	2.3	0
		254,232	Ave. 3.9	Ave. 4.3

It is apparent that the infestation of the Douglas-fir beetle that was observed in 1952, is continuing in its recorded severity. Some areas show an increase for 1952, while others have remained fairly static.

CONCLUSIONS

This season's surveys have shown rather conclusively that the economic importance that has been given to the Douglas-fir beetle, was not misplaced. They have also shown that compiled loss of Douglas-fir over past years were not excessive, but of a most modest nature. Loss of Douglas-fir resulting from bark beetle attack is a serious drain upon this valuable regional timbered resource. These losses are not sporadic but of rather persistent or constant nature.

Compare with earlier statement.